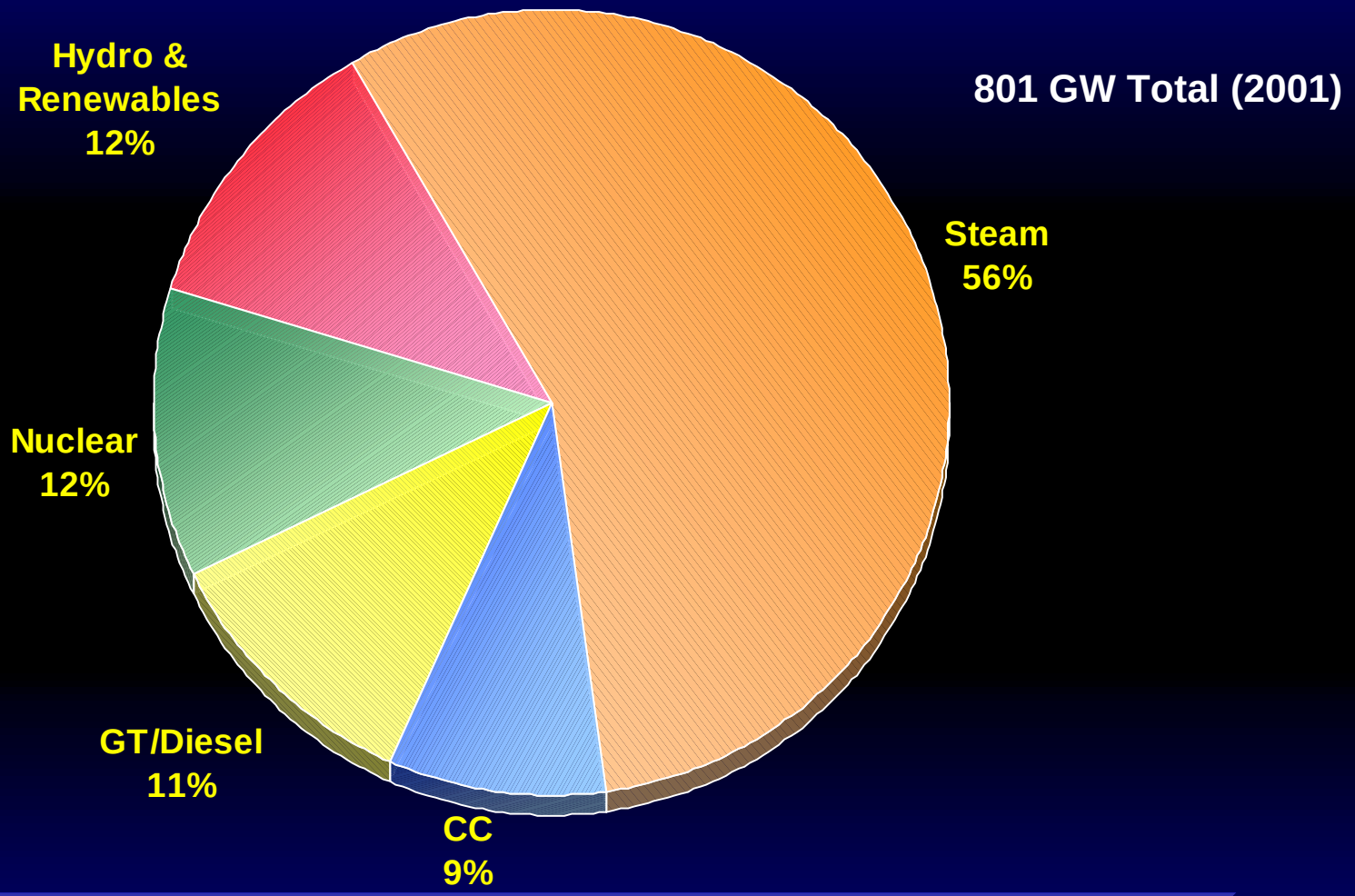
Natural Gas – The Fuel of Choice for Electricity Generation??

Chris Maslak
GE Power Systems
May 14, 2002

United States Installed

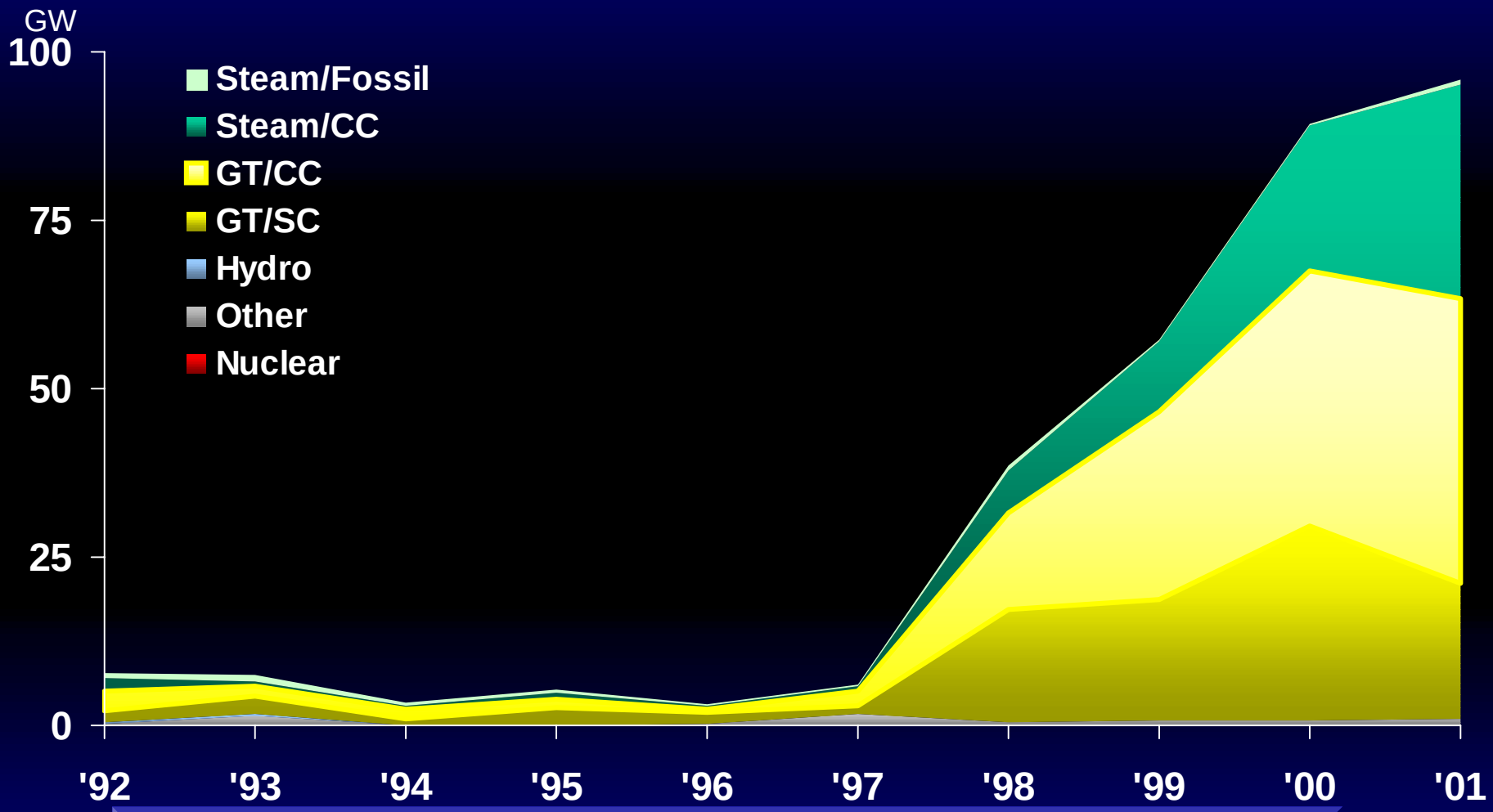
Power Generation Technologies

Source EIA AER2002



Dependable Reserves of Coal and Gas

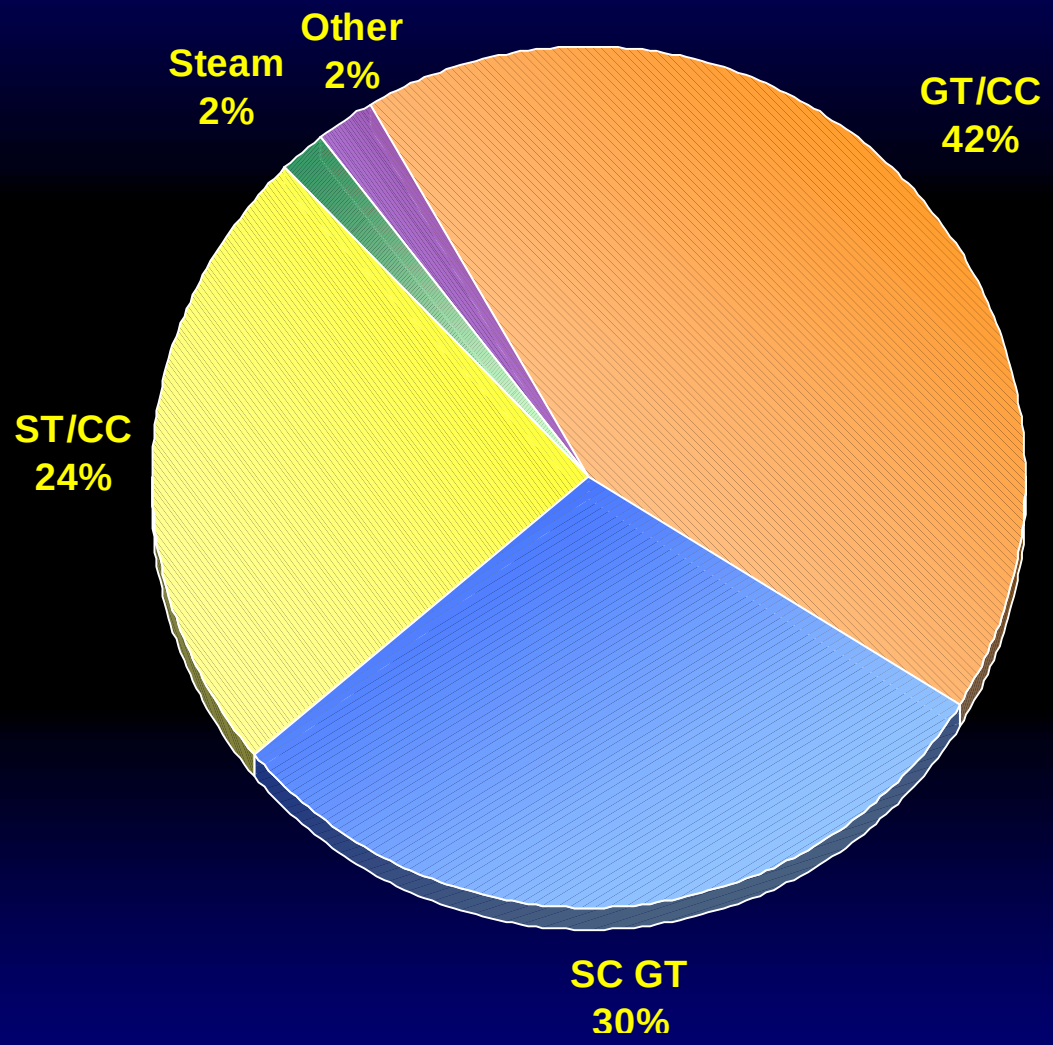
United States Orders By Technology



44% of 2001 Market GT/CC

United States Orders By Technology

1992 - 2001



72% Gas Turbine Based Technology

Future Additions

Multiple Factors Influencing Technology Decision

Power Generation Technology Selection

Power Generation CTQs	Natural Gas CC	Natural Gas SC	Pulverized Coal	IGCC	Hydro	Nuclear
• Short Cycle (Order to Operation)	X	X				
• Very Low Emissions	X	X				
• Ease of Permitting	X	X				
• Low Capital Cost	X	X				
• High Efficiency	X	X				
• High Power Density – Compact Arrangement	X	X				
• Fuel Diversity			X	X	X	X
• Fuel Price Stability			X	X	X	X

Natural Gas Based Generation the Preferred Choice

United States (2001-2010)

United States:

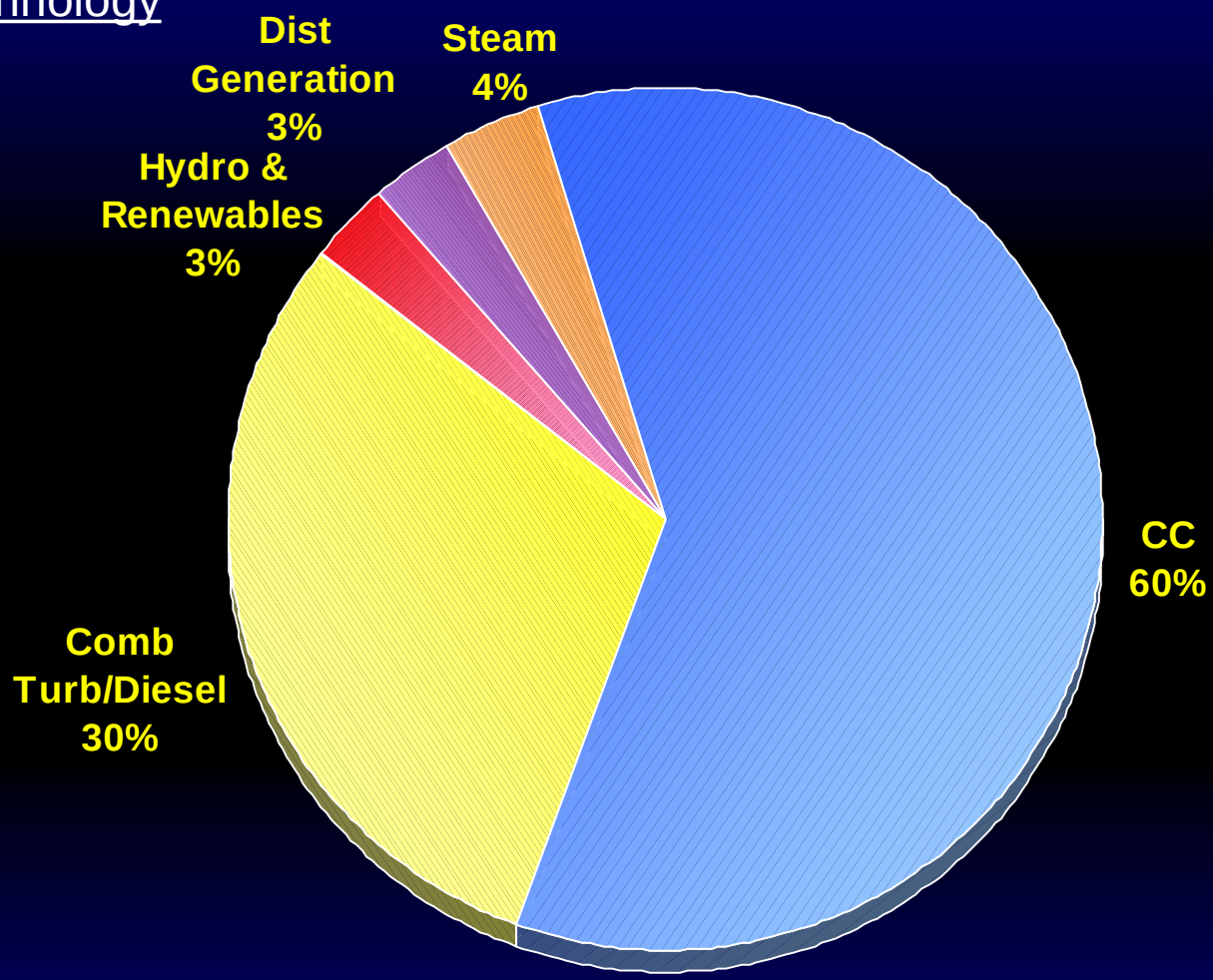
- **Stringent Emissions Standards Make Natural Gas The Fuel of Choice**
- **Electricity Price Volatility Decreasing**
- **Forecast Period Assumption: NG < $4/MBTU**
- **Selective Coal Additions in Indigenous Coal States**
- **California Crisis Prompting States to Re-Examine Deregulation**

United States

Orders Mix by Technology

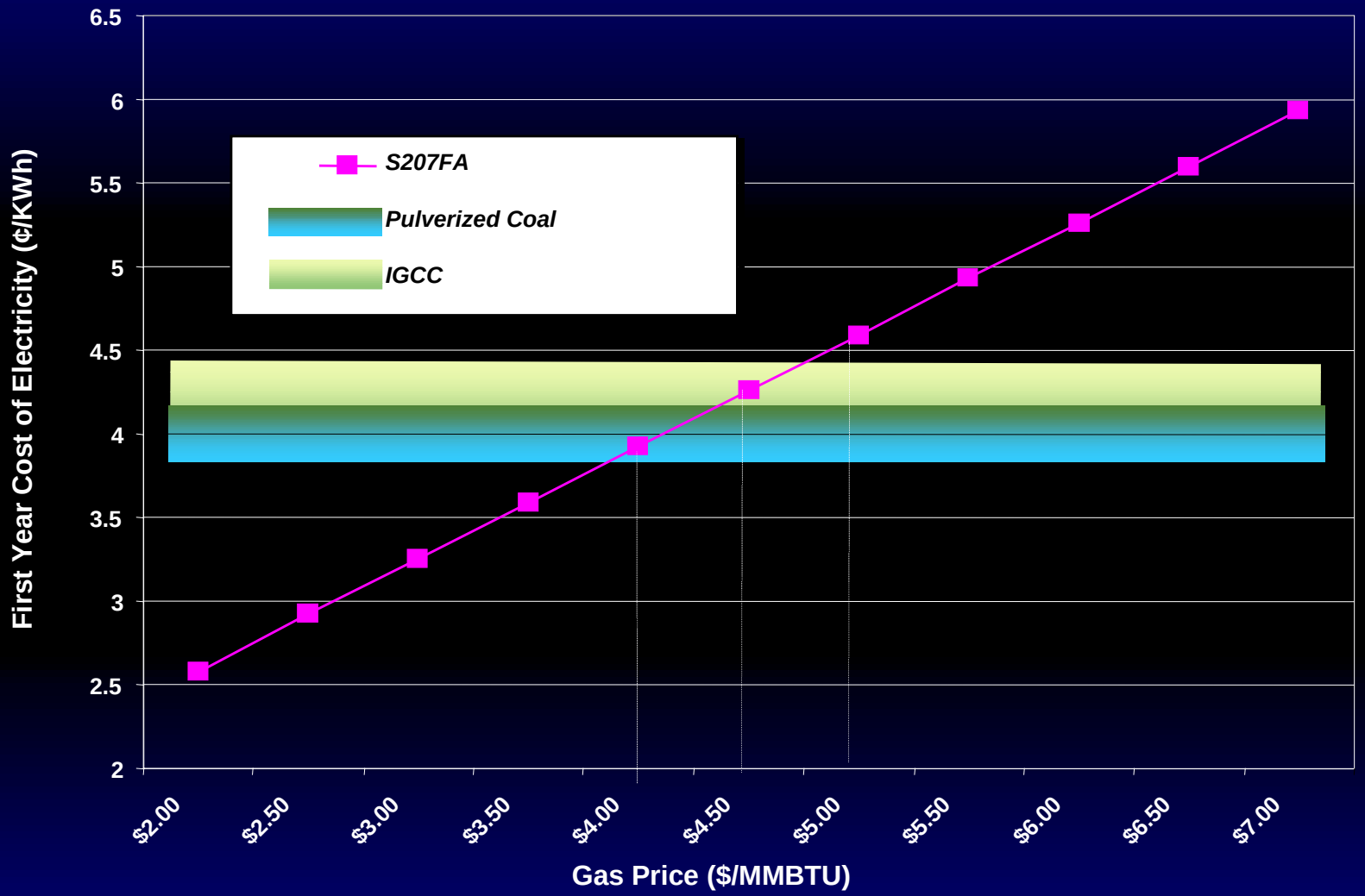
2002 - 2011

Source EIA AER2002

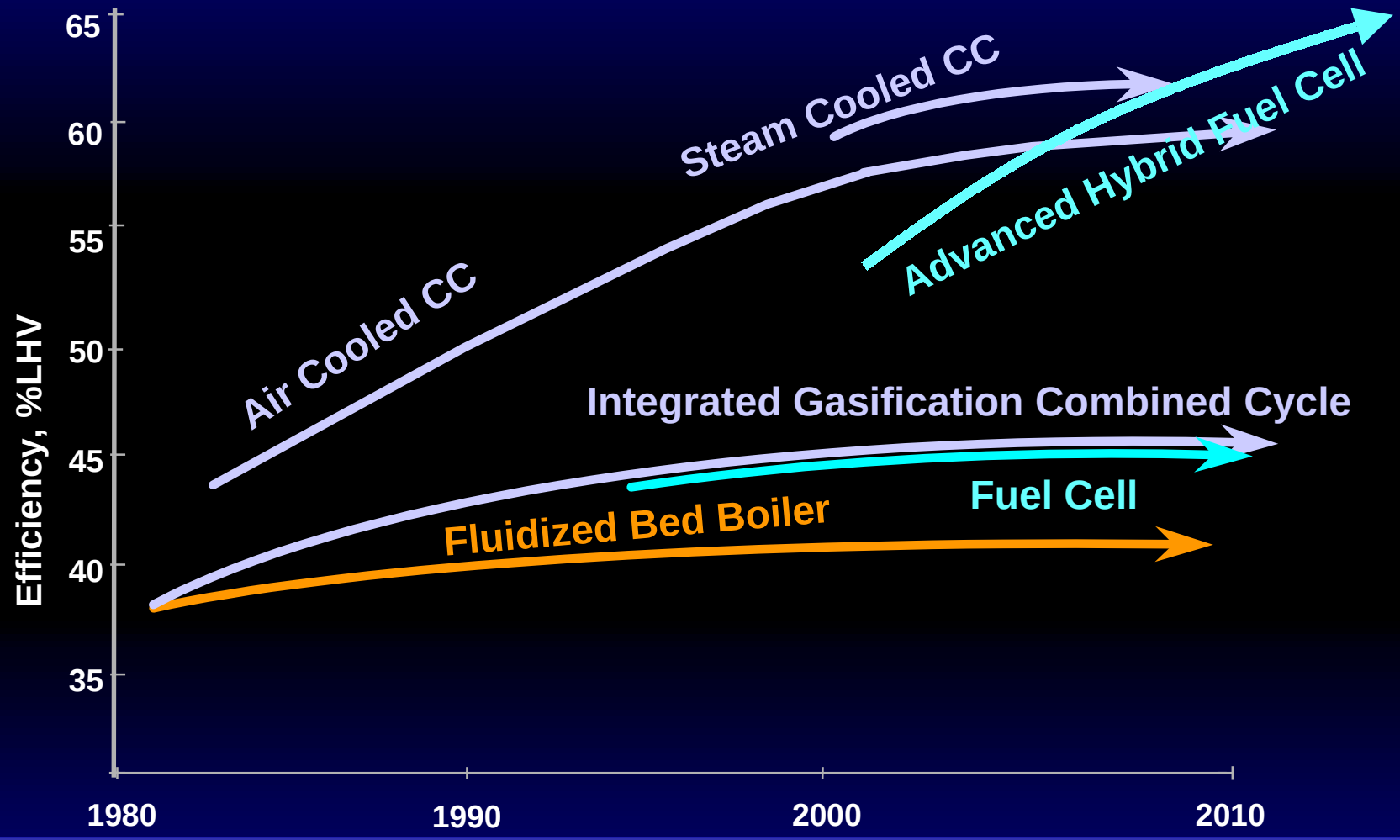


Gas Turbine Technology the Overwhelming Selection

Coal vs. Gas Option Analysis

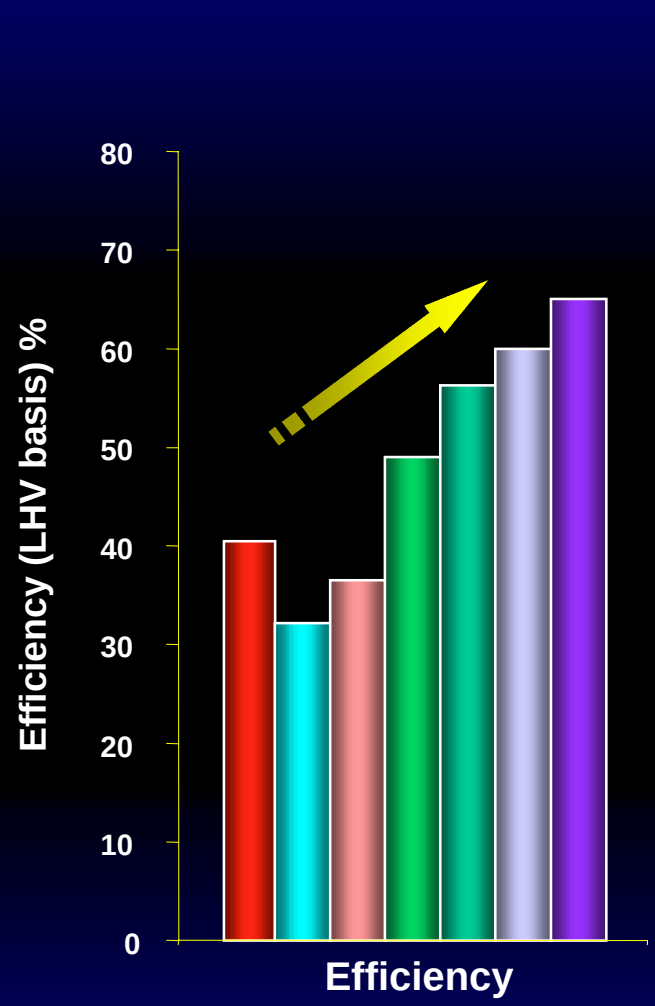


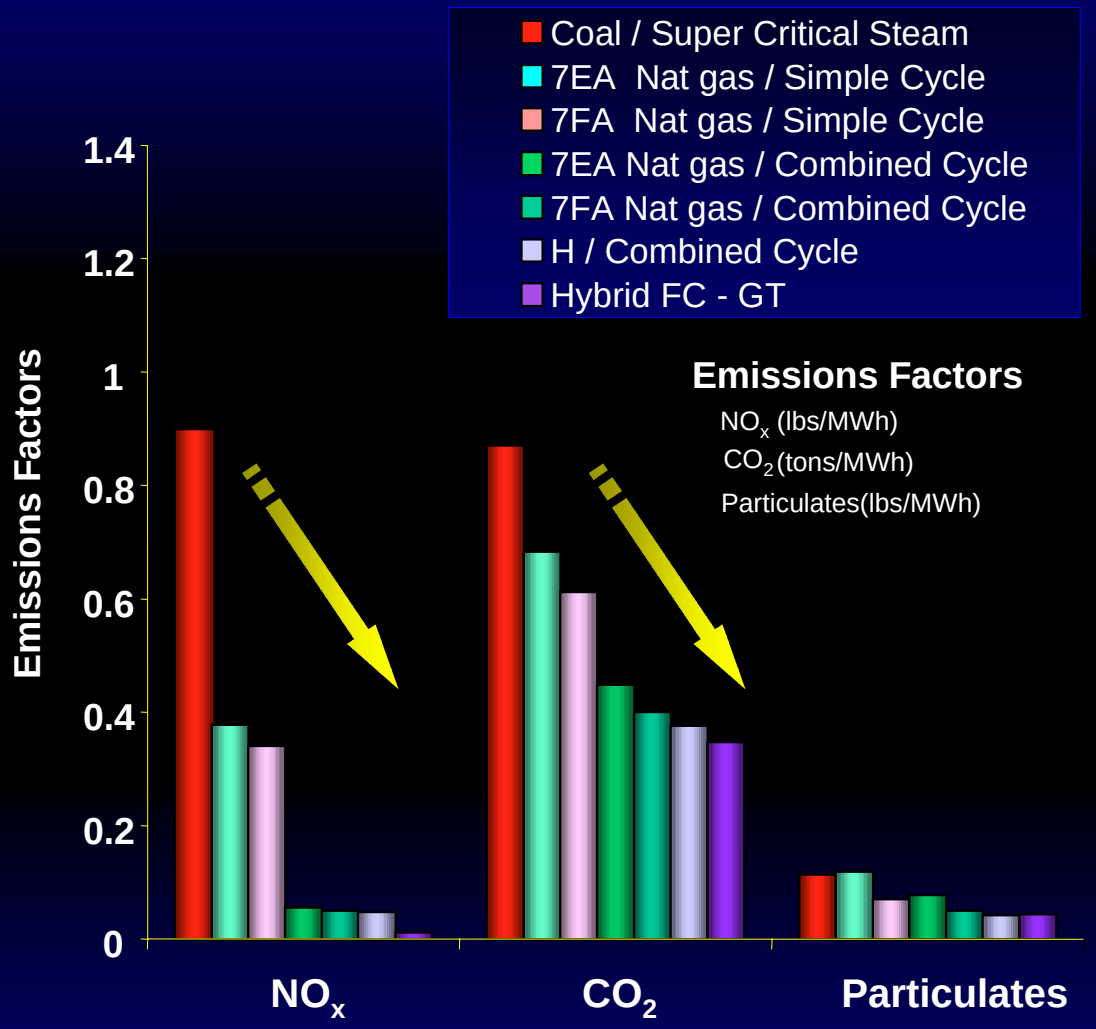
Power Plant Efficiency Trends



Technology Evolution Driven by Fuels, Emissions & Cost

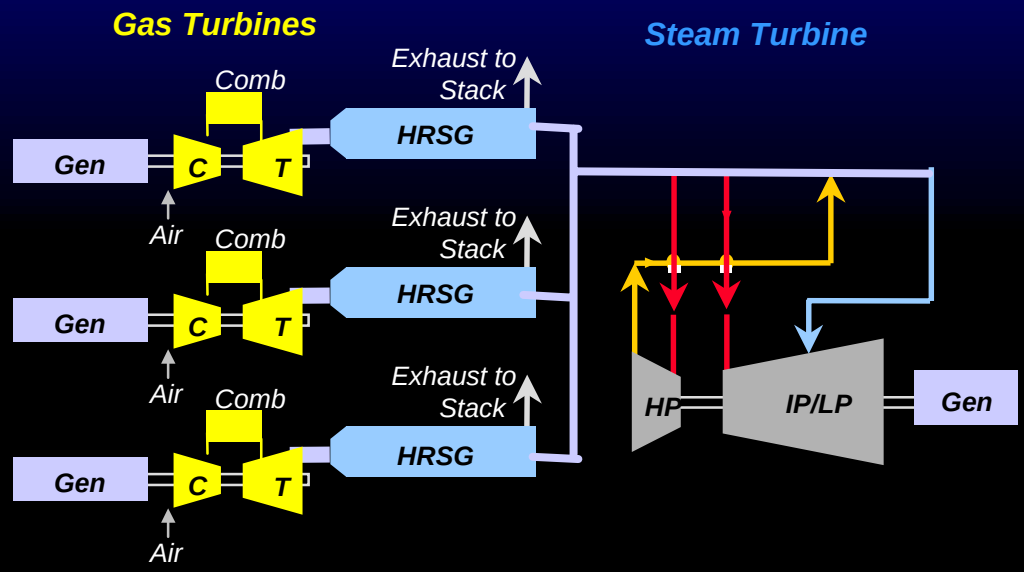
Power Generation Technology Progress





Technology Enables Higher Efficiency, Lower Emissions

7251FB Launch Site



- **Rating: 844 MW**
- **Launch Site: Reliant Energy, Hunterstown, PA**
  - **307FB Power Plant**
  - **Site Construction – Black & Veatch**
  - **Site Work Began 2Q 2001**
  - **FSFL Simple Cycle Field Testing May, 2002**
  - **Commercial Operation of 307FB CC Begins 2Q 2003**

Launch 7FB in Field Testing

9H System Launch Site

9H Gas Turbine on Route to the BP Baglan Bay Complex

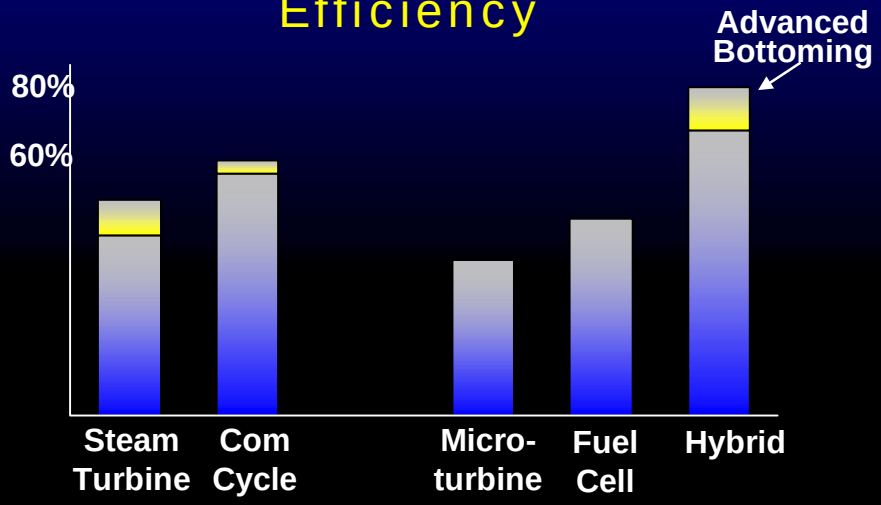
Baglan Bay Energy Park Complex Plant Construction – September 2001

- **109H Rating: 480MW**
- **Launch Site: Baglan Bay, Port Talbot, Wales, UK**
  - **Jointly Developed Plant with British Petroleum - AMOCO**
  - **1 x 109H Power Plant**
  - **Operation 2002**

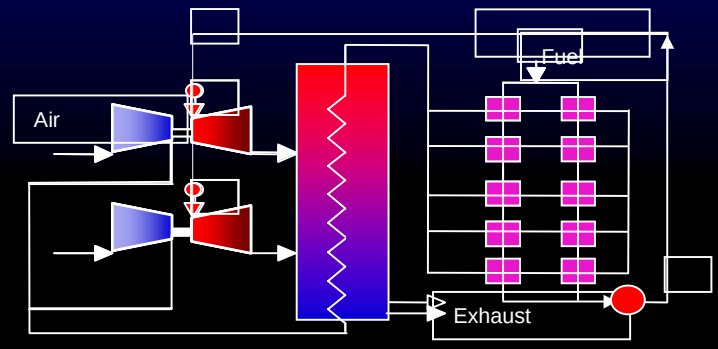
Construction 95% Complete

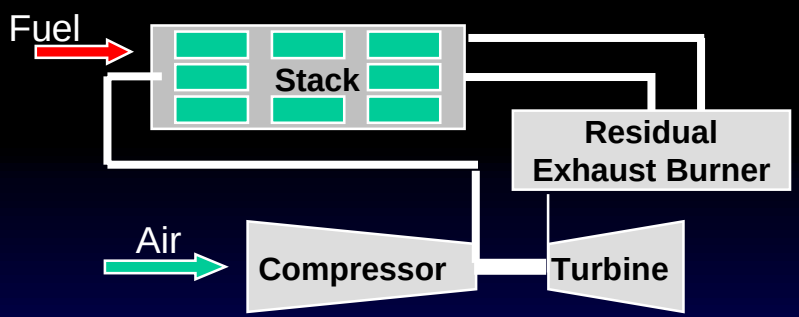
SOFC Hybrid System

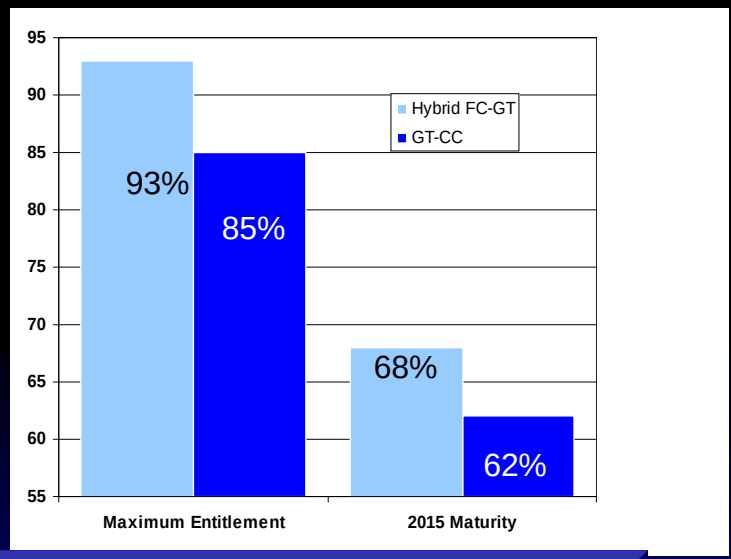
Efficiency



Hybrid Concept







Attractive Efficiency & Emissions Characteristics
But … A Long Term Development Play

Summary

- Market, Regulatory and Environmental Uncertainties
- Short Cycle, High Efficiency, Low Emissions Combine Cycle Systems Is the Fastest Growing Technology
- Continued Focus on Generation Technology Advancements Driven by Customer Value Creation
- Upgrading Gas Turbine, Steam Turbine and Generator Technology for High Efficiency Combined-Cycle Systems
- Fuel Flexibility Through Low Btu and IGCC Technology
- Exploring Breakthrough Technologies and Driving for Cost Effectiveness
- Natural Gas Fuel Segment Growing
- US - Natural Gas Prices Moderating and Expected to Stabilize
- Market Demanding Technology Advances That Deliver Lower Life Cycle Costs

Natural Gas SC & CC System Will Be the Near Term Technology of Choice